Claims

1. Method for the production of mechanical energy in combination with the extraction of cooling and/or heat in connection with a combustion engine (12), which is fed with fuel and air, whereby the machine's inlet air is combined with water vapor before combustion, **characterized by** the treatment of the combustion engine's flue gas in at least one pressurized flue gas condenser (3), whereby the heat flow from this component is utilized by a heat consumer and / or a sorption cycle, and that the flue gas after condensing, but before expansion in a turbine (6b), is reheated in order to avoid ice formation during said expansion.

2. The method according to claim 1, **characterized by** the addition of water vapor and / or condensate from the condenser stages (3,4) to the inlet air.

3. The method according to claim 1 and 2, **characterized by** carrying out flue gas condensing at a flue gas pressure that is at least 2.5 bar absolute pressure, preferably over 3 bar absolute pressure.

4. The method according to parts of claim 1-3, **characterized by** subjecting the combustion engine's inlet air to diabatic humidification at close to atmospheric pressure, whereby heat is transferred from the second stage of the flue gas condenser (4), downstream of the first flue gas condenser stage (3).

5. The method according to parts of claim 1-4, **characterized by** subjecting the combustion engine's inlet air to humidification at raised pressure, through the direct contact between water and compressed air.

6. The method according to parts of claim 1-5, **characterized by** carrying out combustion with an essentially stoichiometric mixture of fuel/air/water.

7. The method according to parts of claim 1-6, **characterized by** reheating the flue gas, after flue gas condensing has occurred, by transferring heat from a warmer part of the flue gas or from the compressed inlet air.

8. The method according to parts of claim 1-7, **characterized by** further heating the reheated flue gas (73) with uncooled flue gas from the combustion engine, whereby the temperature difference between the streams 17 and 73 is under 200 °C and preferably under 100 °C.

9. The method according to parts of claim 1-8, **characterized by** the use of heat flows from the generator (19), oil coolant, or other waste heat flows from the motor to humidify the inlet air to the combustion engine.

10. A device to produce mechanical energy and heat and /or cooling in connection with a combustion engine which has the means to humidify the machine's inlet air, **characterized by** a device to recover heat at elevated pressures from the machine's (12) flue gases, by means of flue gas condensing, which is transferred to a heating net or to a sorption cycle in chosen proportions, and a device to reheat the cooled flue gas after flue gas condensing such that the final expansion can be carried out without ice formation.

11. A device according to claim 10, **characterized by** the addition of water vapor and / or condensate to the inlet air by means of using condensate from the condenser stages (3,4).

12. A device according to parts of claims 10-11 **characterized by** the means (6b) to maintain the flue gases at above-atmospheric pressures in the exit pipe from the combustion engine (12) until a position downstream of the condensers (3,4).

13. A device according to parts of claims 10-12 **characterized by** the means (6b) to add fuel, air and water vapor to the combustion engine to obtain essentially stoichiometric combustion.

14. A device according to parts of claims 10-13 **characterized by** the means to transfer the heat for humidifying the intake air, preferably at the humidification means (5), from the power generator, oil cooling or radiation and convection losses.

15. A device according to parts of claims 10-14 **characterized by** when the combustor engine consists of a pressurized fuel cell.

16. A device according to parts of claims 10-15, **characterized by** the use of extracted heat to drive sorption processes for carbon dioxide removal, where the absorption unit is preferably placed downstream of the final condenser.